

*Elevation from 1922 drawings for State Bridge NC-182.*

Constructed in 1920, the bridge is significant as an early, multiple-span example of a standard encased steel multi girder bridge designed by the state highway department. Established in 1917, the department did not begin the improvement of the state's roads and bridges in earnest until late 1919, after World War I and the passage of the State Aid Road Law, which authorized bonds to match federal financing. The standard-design encased steel multi girder bridge with paneled parapets lent itself to the state's campaign to improve the large number of bridges taken into the newly created state

highway system. Similar bridges were used throughout the state, although most extant examples are single span. The bridge type offered economy of design, ease of construction, and long-term maintenance cost benefits from the encased beams.

The bridge was built under Delaware State Highway Department contract 24A, one of the earliest contracts issued by the state. The contract was awarded to James A. Hiron of Dover for approximately \$84,500, and Hiron, in turn, sublet the contract to the S. S. Jones Contracting Corporation of New York City.

### Faulkland Road (Road 270) over Hyde Run

*State Bridge NC-182*

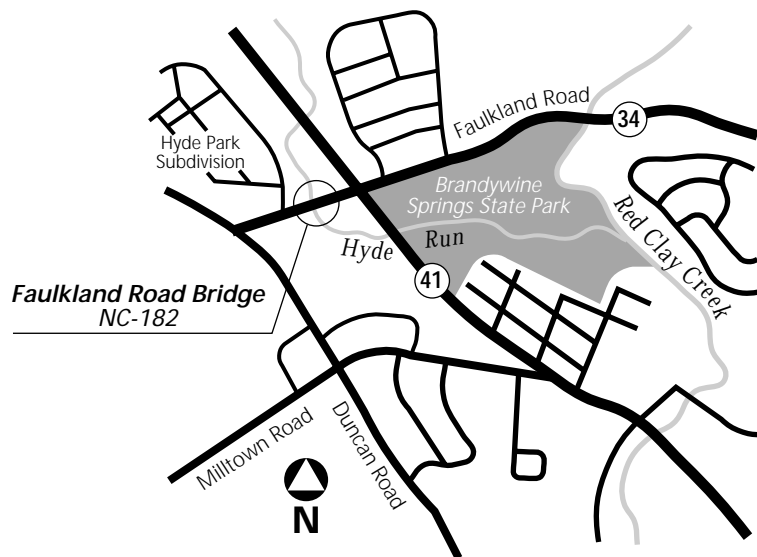
*Northwest of Prices Corner,  
New Castle County*

*Designer/Builder: New Castle County  
Engineer/Vincenzo Giovannozzi & Bros.*

**1922**

The Faulkland Road bridge is a 27'-long, 26'-wide, encased steel multi girder bridge built in 1922 for the New Castle County government. It is finished with incised paneled parapets that taper to a shal-

# Metal Girder Bridges



lower depth at the end posts. The bridge is supported on concrete abutments with wingwalls. The seven lines of encased I beams at 4' spacings are supported on bridge seats that project outward from the abutments.

Contractor Vincenzo Giovannozzi & Brothers of Wilmington built the Faulkland Road bridge based on plans prepared by the county engineer. It is an early and complete example of a common county-built bridge type from the late 1910s to 1930s. It reflects the trend toward standardized 20th-century bridge types, such as the encased steel multi girder and the reinforced concrete

**ABOVE: The Faulkland Road bridge (State Bridge NC-182) is an encased steel multi girder bridge that was built to plans prepared by the New Castle County Engineer in 1922.**

**LEFT: Many covered bridges, such as the one previously on Faulkland Road, were replaced as part of the road and bridge improvement campaigns of the first half of the 20th century. Encased steel multi girder bridges were a standard bridge type commonly used by Delaware's state and county governments for bridge replacement projects.**





## Wilmington

**North Market  
Street Bridge  
NC-575**

slab, as the county government pursued a systematic program of replacing obsolescent bridges, including covered bridges such as the one previously at this site. The replacement structures were designed to ac-

commodate increased and heavier motorized traffic. This bridge was designed for a 15-ton truck loading, a common live-load unit of the period.

### North Market Street (Road 24) over Brandywine Creek

*State Bridge NC-575*

*Wilmington, New Castle County*

*Designer/Builder: Harrington, Howard &  
Ash/Frederick Snare Corporation*

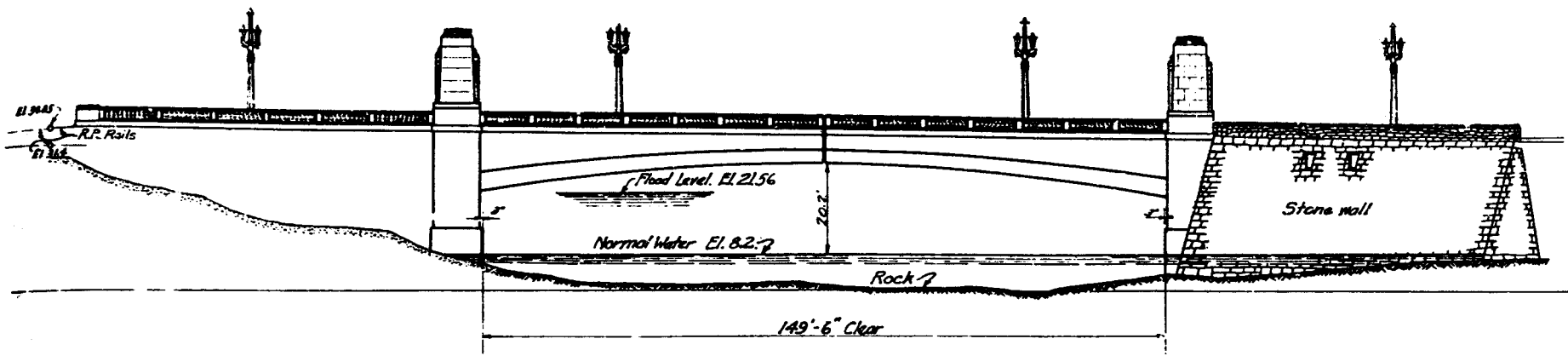
**1928**

The 1928 North Market Street bridge is an unusual, one-span, 213'-long, 83'-wide, steel cantilevered multi girder bridge composed of nine lines of haunched, built-up steel beams that are cantilevered from the abutments. The beams are connected at the abutments to concrete counterweights located in pockets extending 29' into the abutments. They anchor the dead and live



*The 1928 North Market Street Bridge (State Bridge NC-575).*

# Metal Girder Bridges



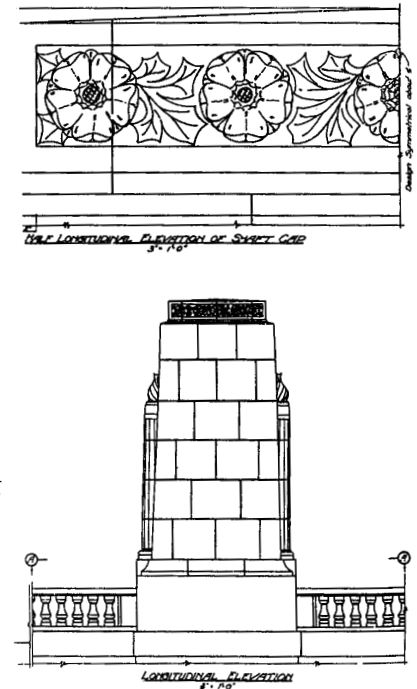
loads. Shear locks at mid span transfer shear forces across the beams. The fascia beams are concrete encased and scored to give the appearance of an arch. The bridge is finished by stone pylons and concrete balustrades with urn-shaped balusters.

The design of the bridge was mandated by constraints at the crossing such a high flood level and the existing grade of North Market Street. The bridge is historically noteworthy for the uncommon cantilever design, which allowed the builders to span a greater distance than would have been feasible with available rolled beams and also required a minimum of falsework. The only other example of a cantilevered steel multi girder bridge of similar age in the state is the 1931 Rockland bridge (State Bridge NC-2), also over Brandywine Creek.

The nationally recognized engineering firm of Harrington, Howard & Ash of Kansas City and New York City designed the bridge for New Castle County with the project under the direction of County Engineer Charles E. Grubb. The firm, established in the 1890s, was noteworthy for movable bridge designs before expanding to a variety of civil and structural engineering projects during the mid 20th century under the reorganized firm-name of Ash, Howard, Needles & Tammen. The firm was very active in Delaware and provided consulting services to the county and state highway department beginning in the early 1920s. General contractor for the North Market Street bridge was the Frederick Snare Corporation of Philadelphia and New York, for a bid of \$382,060.

**ABOVE:** Elevation drawing of the North Market Street Bridge, as prepared by Harrington, Howard & Ash, consulting engineers, in 1928.

**RIGHT:** Decorative details, such as the pylons with carved-stone cap, were befitting the North Market Street bridge's prominent downtown Wilmington location.



The present North Market Street bridge is believed to be the fifth bridge at this crossing. Authorized in 1762 by the Delaware General Assembly, the first Market Street bridge, a timber structure, was completed in 1764, replacing the previous ferry that had operated from a landing on French Street. The first bridge underwent numerous repairs, and in 1806, a company was formed to replace the deteriorated span with a stone arch bridge. That bridge was never built because local merchants and millers objected that the stone arch would restrict the waterway. The Levy Court continued to study various proposals for different bridges but took no action until 1809, when \$4,000 was appropriated to construct a chain suspension bridge, which would not restrict the stream. Completed in 1810, the suspension bridge remained in use until 1822, when a freshet washed it away. A timber covered bridge was next constructed, the first in Delaware; however, it too was destroyed by a flood in 1839. Master bridge builder Lewis Wernwag constructed the next bridge, a covered timber truss-arch that remained in place until 1887 when a

wrought-iron Pratt thru truss, fabricated by the New Jersey Steel and Iron Company, was erected in its place.

By the mid 1920s, the metal truss bridge was no longer adequate to the needs of increased automobile traffic. A traffic study conducted by the New Castle County Engineer revealed that 85 percent of the traffic on the bridge comprised passenger automobiles, and when combined with streetcar traffic was contributing to downtown traffic jams. Local businessmen looked forward to an improved crossing with greater capacity, which they believed would encourage economic growth. Specifications for the 1928 replacement bridge provided for a paved roadway of 60', accommodating double streetcar tracks, and two, 10'-wide sidewalks, more than doubling the capacity of the previous bridge. In order to maintain traffic during construction, the county required the contractor to complete the western side of the new bridge while traffic continued to use the previous metal truss bridge. When the western side was finished, the traffic was shifted to the completed portion while the old truss was re-

moved and then the east side of the new bridge was constructed in its place.

The Market Street bridge is located in the Brandywine Village Historic District, historically significant for its collection of 18th- and 19th-century homes, mills, and artisans shops, concentrated on the north bank of the creek.

### Old Capitol Trail over Red Clay Creek (*Marshallton Bridge*)

*State Bridge NC-155*

*Marshallton, New Castle County*

*Designer/Builder: State Highway  
Department Bridge Division/George  
E. Shockley*

**1931**

The Marshallton bridge is a skewed, one-span, 119'-long, 24'-wide, built-up steel thru girder bridge. Finished with a segmental profile to the top, it is significant as an example of a common 20th-century bridge type with custom architectural detailing, documenting State Bridge Engineer Arthur G. Livingston's efforts to apply individual aesthetic treatments to many of the

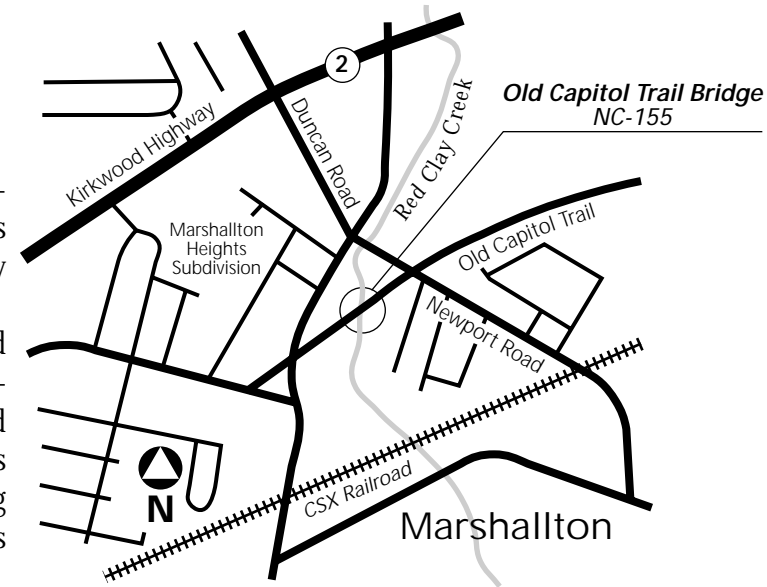
# Metal Girder Bridges

bridges on the state's highway system. Built in 1931, the bridge has two cantilevered sidewalks finished with decorative metal railings with diamond-shape cutouts. Concrete block end posts are topped by obelisks with stepped pedestals and copper luminaires. The bridge is supported on concrete abutments with wingwalls.

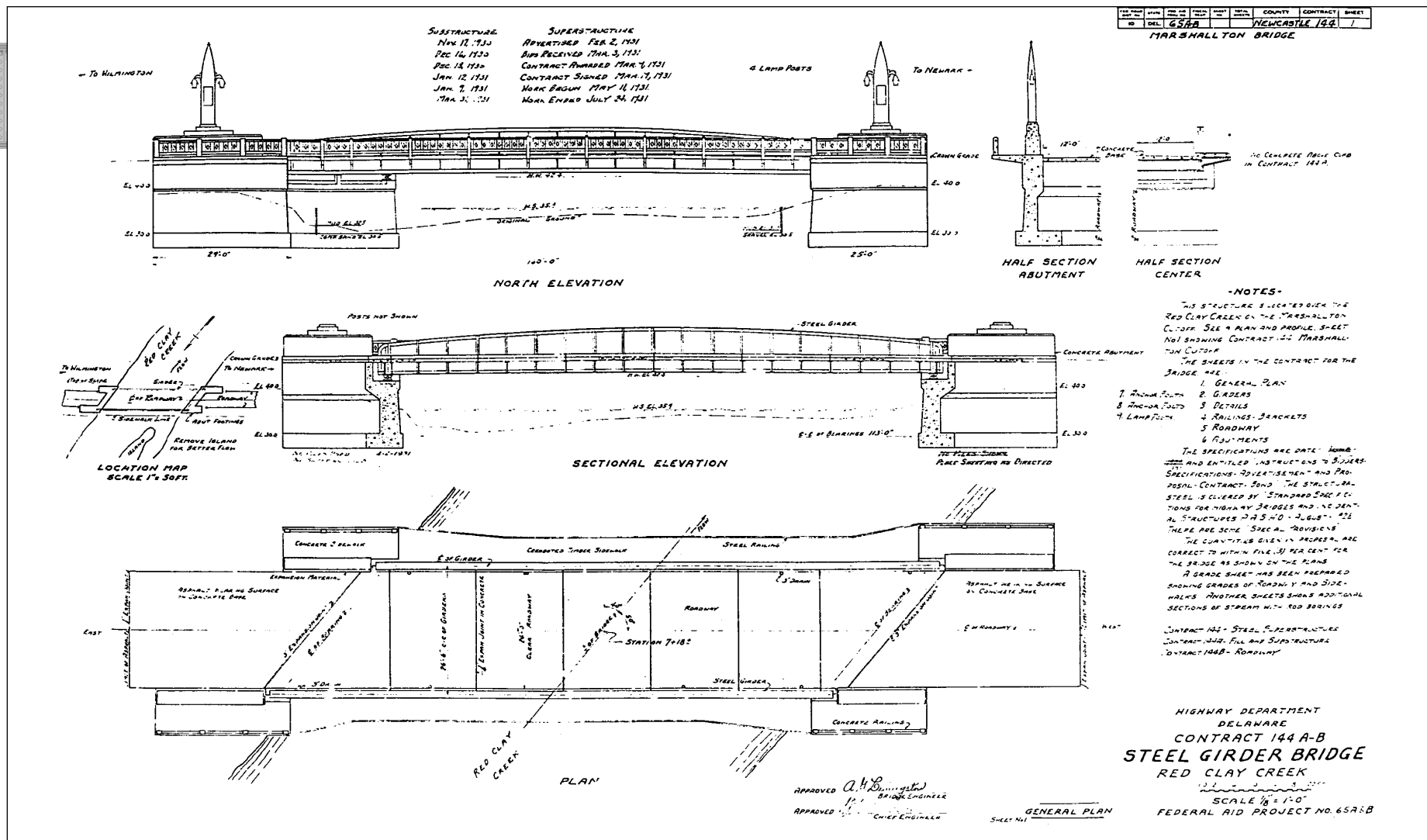
The Marshallton bridge was highlighted in the State Highway Department's *Annual Report* (1931), which stated that "through careful attention to details in its design this bridge presents an unusually pleasing appearance and with its approaches eliminates the traffic congestion and hazards which formerly existing on account of the narrow and winding route through town." The bridge was constructed as part of a 1930-31 road relocation project called the "Marshallton Cutoff." The cutoff bypassed the former state route, which was carried over Red Clay Creek on a 1919 Warren pony truss bridge (non-extant) located several hundred feet upstream of the present bridge. Road relocations were a common feature of the state highway department's efforts to improve the state highway system to meet

the demands of increasing automotive traffic from the 1920s to the 1950s, and this project, like many others, was assisted by federal-aid funds.

The department opened the cutoff and bridge at a formal celebration held on November 21, 1931. A newspaper item called the bridge "one of the finest structures of its kind in the county, the light standards adding much to its beauty." The concrete obelisks



*The 1931 Marshallton bridge (State Bridge NC-155).*



Elevation, section, and plan from the 1930 drawings for the Marshallton bridge prepared by the Delaware State Highway Department's Bridge Division.

marking the portals supported "Venetian" pendant lanterns on cast-bronze "Commonwealth" brackets, supplied by the Westinghouse Electric & Manufacturing Company.

DelDOT contract records indicate that the substructure was built by D. E. O'Connell & Sons of Ridley Park, Pennsylvania, and the superstructure was done by George E. Shockley of Rehoboth, Delaware. The total cost of the bridge was \$32,300. Shop drawings and bills of material document that the structural steel was furnished by the

Shoemaker Bridge Company of Pottstown, Pennsylvania, and the decorative steel railing by the Bauman Iron Works of Reading. In 1982, some rivets, mostly on the bottom flanges and floorbeam connections, were replaced by high-strength bolts. The original concrete slab deck has been replaced by a steel deck pan and concrete deck.

# Metal Girder Bridges



**Ease and speed of erection is a favorable construction feature of steel girder bridges. Photographs show the Marshallton bridge's prefabricated steel girders arriving via a nearby railroad (a), and then after being trucked to the bridge site, positioned by a crane (b). After connecting the floor-beams and placing the deck, workers apply the finishing touches, such as the pylons and luminaires (c). The completed bridge opened in July 1931, a mere five months after the contract had been awarded in March (d).**

## Road 46 over Deep Creek

*State Bridge S-239*

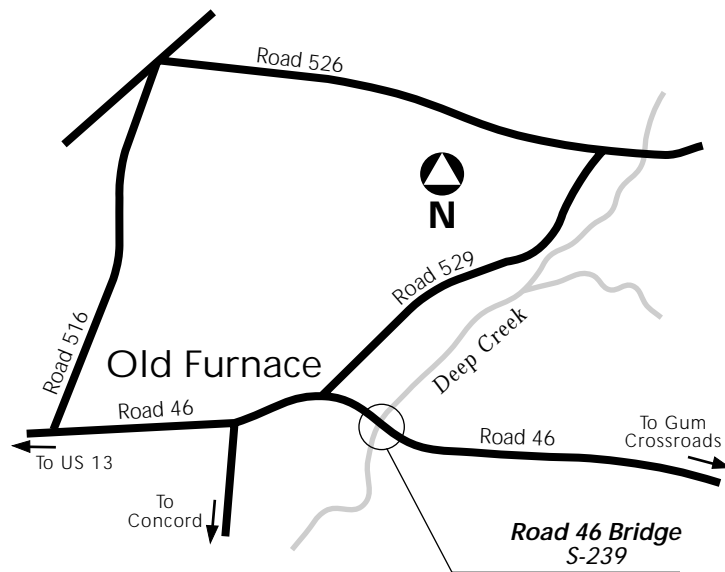
*Old Furnace, Sussex County*

*Designer/Builder: State Highway  
Department Bridge Division/Continental  
Contracting Corp.*

**1932**

**T**he Road 46 bridge is a one-span, 40'-long, 31'-wide, encased steel multi girder bridge built in 1932. The bridge is finished by paneled concrete parapets with corbeled coping, and it is supported on concrete abutments with wingwalls topped by plain concrete parapets. The bridge is significant as a well-preserved example of the standard design, encased steel multi girder bridges built in numbers by the state highway department during the 1920s and 1930s.

The bridge was built as part of a state highway department project to pave and realign Road 46 between Gum Crossroads



*The 1932 Road 46 bridge (State Bridge S-239) is a complete example of the standard encased steel multi girder bridge built in numbers by the state highway department during the 1920s and 1930s.*



and Middleford, a distance of nearly four miles. General contractor for the project was the Continental Contracting Company of Baltimore. The bridge was located on a realigned portion of the road, replacing an earlier bridge, also a steel multi girder span.

An interesting sidelight to the story of this standard replacement bridge was that it was determined during construction of the foundations that the timber pilings needed to be increased in length in order to achieve adequate bearing, apparently a common problem encountered in the sandy soils of Sussex County. In contract correspondence, supervising engineer John R. Hitchins observed, "I do not believe we have ever constructed a bridge in Sussex County using the length of piles planned. In every case we found them too short." Longer piles were more costly, but did not represent unusual technical problems.

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## Rockland Road (Road 235) over Wilson Run

*State Bridge NC-68*

*Rockland, New Castle County*

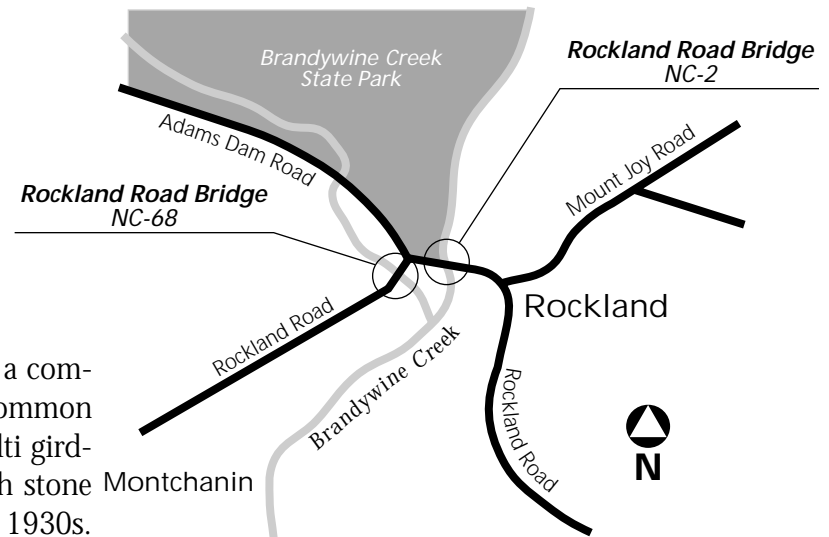
*Designer/Builder: New Castle County  
Engineer/Charles H. Dunleavy*

**1932**

The Rockland Road over Wilson Run bridge is a one-span, 23'-long, 34'-wide, encased steel multi girder bridge built in 1932. It is finished by stone parapets and is supported on rubble masonry abutments with wingwalls. A small, two-story, stone building, which is believed to have been associated with a former grist mill, is built into the bridge's southwest wingwall. The original function of the building is unclear, although it may have served as a springhouse or mill-race gatehouse. The bridge's northeast wingwall is contiguous with the stone wingwall of State Bridge NC-2, built in 1933.

The bridge is significant as a complete example of the once common county-built encased steel multi girder bridge type and design with stone parapets from the 1910s to the 1930s. It is also a contributing resource in the National Register-listed Rockland Historic District. Rockland is a former mill village surrounding a 19th-century paper mill complex on the east bank of Brandywine Creek, and the site of a former grist mill on the west bank of the creek, adjacent to the bridge.

Contractor Charles H. Dunleavy of Coatesville, Pennsylvania, built the bridge based on plans prepared by the New Castle County Engineer. The project included removal of a pony truss bridge and replacement with the steel multi girder superstructure. The previous abutments were reused, although



**The 1932 Rockland Road over Wilson Run bridge (State Bridge NC-68) is a complete example of the common county-built encased steel multi girder bridge design with stone parapets.**

